



General

Guideline Title

Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period.

Bibliographic Source(s)

National Collaborating Centre for Women and Children's Health. Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. London (UK): National Institute for Health and Care Excellence (NICE); 2015 Feb 25. 65 p. (NICE guideline; no. 3).

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: National Collaborating Centre for Women's and Children's Health. Diabetes in pregnancy. Management of diabetes and its complications from pre-conception to the postnatal period. London (UK): National Institute for Health and Clinical Excellence (NICE); 2008 Mar. 21 p. (Clinical guideline; no. 63).

This guideline meets NGC's 2013 (revised) inclusion criteria.

Regulatory Alert

FDA Warning/Regulatory Alert

Note from the National Guideline Clearinghouse: This guideline references a drug(s) for which important revised regulatory and/or warning information has been released.

- [April 8, 2016 – Metformin-containing Drugs](#) : The U.S. Food and Drug Administration (FDA) is requiring labeling changes regarding the recommendations for metformin-containing medicines for diabetes to expand metformin's use in certain patients with reduced kidney function. The current labeling strongly recommends against use of metformin in some patients whose kidneys do not work normally. FDA concluded, from the review of studies published in the medical literature, that metformin can be used safely in patients with mild impairment in kidney function and in some patients with moderate impairment in kidney function.

Recommendations

Major Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline update was developed by the National Collaborating Centre for Women's and Children's Health on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and relevant appendices.

Recommendations are marked as [new 2015], [2015], [2008] or [2008, amended 2015]:

- [new 2015] indicates that the evidence has been reviewed and the recommendation has been added or updated
- [2015] indicates that the evidence has been reviewed but no change has been made to the recommended action
- [2008] indicates that the evidence has not been reviewed since 2008
- [2008, amended 2015] indicates that the evidence has not been reviewed since 2008, but either changes have been made to the recommendation wording that change the meaning or NICE has made editorial changes to the original wording to clarify the action to be taken.

The wording used in the recommendations in this guideline (for example words such as 'offer' and 'consider') denotes the certainty with which the recommendation is made (the strength of the recommendation) and is defined at the end of the "Major Recommendations" field.

Blood Glucose and Plasma Glucose

This guideline refers frequently to circulating glucose concentrations as 'blood glucose'. A lot of the evidence linking specific circulating glucose concentrations with particular outcomes uses 'plasma' rather than 'blood' glucose. In addition, patient-held glucose meters (which use capillary blood samples) and monitoring systems are all calibrated to plasma glucose equivalents. However, the term 'blood glucose monitoring' is in very common use, so in this guideline the term 'blood glucose' is used, except when referring to concentration values.

Preconception Planning and Care

Information about Outcomes and Risks for Mother and Baby

Aim to empower women with diabetes to have a positive experience of pregnancy and childbirth by providing information, advice and support that will help to reduce the risks of adverse pregnancy outcomes for mother and baby. [2008]

Explain to women with diabetes who are planning to become pregnant that establishing good blood glucose control before conception and continuing this throughout pregnancy will reduce the risk of miscarriage, congenital malformation, stillbirth and neonatal death. It is important to explain that risks can be reduced but not eliminated. [2008]

Give women with diabetes who are planning to become pregnant, and their family members, information about how diabetes affects pregnancy and how pregnancy affects diabetes. The information should cover:

- The role of diet, body weight and exercise
- The risks of hypoglycaemia and impaired awareness of hypoglycaemia during pregnancy
- How nausea and vomiting in pregnancy can affect blood glucose control
- The increased risk of having a baby who is large for gestational age, which increases the likelihood of birth trauma, induction of labour and caesarean section
- The need for assessment of diabetic retinopathy before and during pregnancy
- The need for assessment of diabetic nephropathy before pregnancy
- The importance of maternal blood glucose control during labour and birth and early feeding of the baby, in order to reduce the risk of neonatal hypoglycaemia
- The possibility of temporary health problems in the baby during the neonatal period, which may require admission to the neonatal unit
- The risk of the baby developing obesity and/or diabetes in later life [2008]

The Importance of Planning Pregnancy and the Role of Contraception

Ensure that the importance of avoiding an unplanned pregnancy is an essential component of diabetes education from adolescence for women with diabetes. [2008, amended 2015]

Explain to women with diabetes that their choice of contraception should be based on their own preferences and any risk factors (as indicated by [UK medical eligibility criteria for contraceptive use \[UKMEC\] 2009](#) [revised 2010]). [new 2015]

Advise women with diabetes that they can use oral contraceptives (if there are no standard contraindications to their use). [new 2015]

Advise women with diabetes who are planning to become pregnant:

- That the risks associated with pregnancy in women with diabetes increase with how long the woman has had diabetes
- To use contraception until good blood glucose control (assessed by glycated haemoglobin [HbA1c] level¹ – see recommendation below) has been established
- That blood glucose targets, glucose monitoring, medicines for treating diabetes (including insulin regimens for insulin-treated diabetes) and medicines for complications of diabetes will need to be reviewed before and during pregnancy
- That extra time and effort is needed to manage diabetes during pregnancy and that she will have frequent contact with healthcare professionals [2015]

Give women with diabetes who are planning to become pregnant information about the local arrangements for support during pregnancy, including emergency contact numbers. [2015]

Diet, Dietary Supplements and Body Weight

Offer women with diabetes who are planning to become pregnant individualised dietary advice. [2008]

Offer women with diabetes who are planning to become pregnant and who have a body mass index (BMI) above 27 kg/m² advice on how to lose weight, in line with the NGC summary of the NICE guideline [Obesity: identification, assessment and management of overweight and obesity in children, young people and adults](#). [2008]

Advise women with diabetes who are planning to become pregnant to take folic acid (5 mg/day) until 12 weeks of gestation to reduce the risk of having a baby with a neural tube defect. [2008]

Monitoring Blood Glucose and Ketones in the Preconception Period

Offer women with diabetes who are planning to become pregnant monthly measurement of their HbA1c level¹. [2008]

Offer women with diabetes who are planning to become pregnant a meter for self-monitoring of blood glucose. [2008]

If a woman with diabetes who is planning to become pregnant needs intensification of blood glucose-lowering therapy, advise her to increase the frequency of self-monitoring of blood glucose to include fasting levels and a mixture of pre-meal and post-meal levels. [2008]

Offer women with type 1 diabetes who are planning to become pregnant blood ketone testing strips and a meter, and advise them to test for ketonaemia if they become hyperglycaemic or unwell. [new 2015]

Target Blood Glucose and HbA1c Levels in the Preconception Period

Agree individualised targets for self-monitoring of blood glucose with women who have diabetes and are planning to become pregnant, taking into account the risk of hypoglycaemia. [2008]

Advise women with diabetes who are planning to become pregnant to aim for the same capillary plasma glucose target ranges as recommended for all people with type 1 diabetes². [new 2015]

Advise women with diabetes who are planning to become pregnant to aim to keep their HbA1c level¹ below 48 mmol/mol (6.5%), if this is achievable without causing problematic hypoglycaemia. [new 2015]

Reassure women that any reduction in HbA1c level towards the target of 48 mmol/mol (6.5%) is likely to reduce the risk of congenital malformations in the baby. [new 2015]

Strongly advise women with diabetes whose HbA1c level is above 86 mmol/mol (10%) not to get pregnant because of the associated risks (see recommendation above). [2015]

Safety of Medicines for Diabetes before and during Pregnancy

Women with diabetes may be advised to use metformin³ as an adjunct or alternative to insulin in the preconception period and during pregnancy, when the likely benefits from improved blood glucose control outweigh the potential for harm. All other oral blood glucose-lowering agents should be discontinued before pregnancy and insulin substituted. [2008]

Be aware that data from clinical trials and other sources do not suggest that the rapid-acting insulin analogues (aspart and lispro) adversely affect the pregnancy or the health of the fetus or newborn baby. [2008]

Use isophane insulin (also known as neutral protamine Hagedorn [NPH] insulin) as the first choice for long-acting insulin during pregnancy. Consider continuing treatment with long-acting insulin analogues (insulin detemir or insulin glargine) in women with diabetes who have established good blood glucose control before pregnancy⁴. [2008, amended 2015]

Safety of Medicines for Complications of Diabetes before and during Pregnancy

Angiotensin-converting enzyme inhibitors and angiotensin-II receptor antagonists should be discontinued before conception or as soon as pregnancy is confirmed. Alternative antihypertensive agents suitable for use during pregnancy should be substituted. [2008]

Statins should be discontinued before pregnancy or as soon as pregnancy is confirmed. [2008]

Removing Barriers to the Uptake of Preconception Care and When to Offer Information

Explain to women with diabetes about the benefits of preconception blood glucose control at each contact with healthcare professionals, including their diabetes care team, from adolescence. [2008]

Document the intentions of women with diabetes regarding pregnancy and contraceptive use at each contact with their diabetes care team from adolescence. [2008]

Ensure that preconception care for women with diabetes is given in a supportive environment, and encourage the woman's partner or other family member to attend. [2008, amended 2015]

Education and Advice

Offer women with diabetes who are planning to become pregnant a structured education programme as soon as possible if they have not already attended one (see [Guidance on the use of patient-education models for diabetes](#) [NICE technology appraisal guidance 60])⁵. [2008]

Offer women with diabetes who are planning to become pregnant preconception care and advice before discontinuing contraception. [2008]

Retinal Assessment in the Preconception Period

Offer retinal assessment (see recommendation below) to women with diabetes seeking preconception care at their first appointment (unless they have had an annual retinal assessment in the last 6 months) and then annually if no diabetic retinopathy is found. [2008]

Carry out retinal assessment by digital imaging with mydriasis using tropicamide, in line with the UK National Screening Committee's recommendations for annual mydriatic 2-field digital photographic screening as part of a systematic screening programme. [2008]

Advise women with diabetes who are planning to become pregnant to defer rapid optimisation of blood glucose control until after retinal assessment and treatment have been completed. [2008]

Renal Assessment in the Preconception Period

Offer women with diabetes a renal assessment, including a measure of low-level albuminuria (microalbuminuria), before discontinuing contraception. If serum creatinine is abnormal (120 micromol/litre or more), the urinary albumin:creatinine ratio is greater than 30 mg/mmol or the estimated glomerular filtration rate (eGFR) is less than 45 ml/minute/1.73m², referral to a nephrologist should be considered before discontinuing contraception. [2008, amended 2015]

Gestational Diabetes

Risk Assessment, Testing and Diagnosis

Risk Assessment

So that women can make an informed decision about risk assessment and testing for gestational diabetes, explain that:

- In some women, gestational diabetes will respond to changes in diet and exercise.
- The majority of women will need oral blood glucose-lowering agents or insulin therapy if changes in diet and exercise do not control gestational diabetes effectively.
- If gestational diabetes is not detected and controlled, there is a small increased risk of serious adverse birth complications such as shoulder dystocia.

- A diagnosis of gestational diabetes will lead to increased monitoring, and may lead to increased interventions, during both pregnancy and labour. [new 2015]

Assess risk of gestational diabetes using risk factors in a healthy population. At the booking appointment, determine the following risk factors for gestational diabetes:

- BMI above 30 kg/m²
- Previous macrosomic baby weighing 4.5 kg or above
- Previous gestational diabetes
- Family history of diabetes (first-degree relative with diabetes)
- Minority ethnic family origin with a high prevalence of diabetes

Offer women with any one of these risk factors testing for gestational diabetes (see recommendations below). [2008, amended 2015]

Do not use fasting plasma glucose, random blood glucose, HbA1c, glucose challenge test or urinalysis for glucose to assess risk of developing gestational diabetes. [2015]

Glycosuria Detected by Routine Antenatal Testing

Be aware that glycosuria of 2+ or above on 1 occasion or of 1+ or above on 2 or more occasions detected by reagent strip testing during routine antenatal care may indicate undiagnosed gestational diabetes. If this is observed, consider further testing to exclude gestational diabetes. [new 2015]

Testing

Use the 2-hour 75 g oral glucose tolerance test (OGTT) to test for gestational diabetes in women with risk factors (see recommendation above). [2015]

Offer women who have had gestational diabetes in a previous pregnancy:

- Early self-monitoring of blood glucose or
- A 75 g 2-hour OGTT as soon as possible after booking (whether in the first or second trimester), and a further 75 g 2-hour OGTT at 24 to 28 weeks if the results of the first OGTT are normal [new 2015]

Offer women with any of the other risk factors for gestational diabetes (see recommendation above) a 75 g 2-hour OGTT at 24 to 28 weeks. [2015]

Diagnosis

Diagnose gestational diabetes if the woman has either:

- A fasting plasma glucose level of 5.6mmol/litre or above or
- A 2-hour plasma glucose level of 7.8mmol/litre or above [new 2015]

Offer women with a diagnosis of gestational diabetes a review with the joint diabetes and antenatal clinic within 1 week. [new 2015]

Inform the primary healthcare team when a woman is diagnosed with gestational diabetes (see also the NICE guideline [Patient experience in adult NHS services](#) in relation to continuity of care). [new 2015]

Interventions

Explain to women with gestational diabetes:

- About the implications (both short and long term) of the diagnosis for her and her baby
- That good blood glucose control throughout pregnancy will reduce the risk of fetal macrosomia, trauma during birth (for her and her baby), induction of labour and/or caesarean section, neonatal hypoglycaemia and perinatal death
- That treatment includes changes in diet and exercise, and could involve medicines [new 2015]

Teach women with gestational diabetes about self-monitoring of blood glucose. [2015]

Use the same capillary plasma glucose target levels for women with gestational diabetes as for women with pre-existing diabetes (see

recommendations below). [2015]

Tailor blood glucose-lowering therapy to the blood glucose profile and personal preferences of the woman with gestational diabetes. [new 2015]

Offer women advice about changes in diet and exercise at the time of diagnosis of gestational diabetes. [new 2015]

Advise women with gestational diabetes to eat a healthy diet during pregnancy, and emphasise that foods with a low glycaemic index should replace those with a high glycaemic index. [new 2015]

Refer all women with gestational diabetes to a dietitian. [new 2015]

Advise women with gestational diabetes to take regular exercise (such as walking for 30 minutes after a meal) to improve blood glucose control. [new 2015]

Offer a trial of changes in diet and exercise to women with gestational diabetes who have a fasting plasma glucose level below 7 mmol/litre at diagnosis. [new 2015]

Offer metformin³ to women with gestational diabetes if blood glucose targets are not met using changes in diet and exercise within 1 to 2 weeks. [new 2015]

Offer insulin instead of metformin to women with gestational diabetes if metformin is contraindicated or unacceptable to the woman. [new 2015]

Offer addition of insulin to the treatments of changes in diet, exercise and metformin³ for women with gestational diabetes if blood glucose targets are not met. [new 2015]

Offer immediate treatment with insulin, with or without metformin³, as well as changes in diet and exercise, to women with gestational diabetes who have a fasting plasma glucose level of 7.0 mmol/litre or above at diagnosis. [new 2015]

Consider immediate treatment with insulin, with or without metformin³, as well as changes in diet and exercise, for women with gestational diabetes who have a fasting plasma glucose level of between 6.0 and 6.9 mmol/litre if there are complications such as macrosomia or hydramnios. [new 2015]

Consider glibenclamide⁶ for women with gestational diabetes:

- In whom blood glucose targets are not achieved with metformin but who decline insulin therapy or
- Who cannot tolerate metformin [new 2015]

Antenatal Care for Women with Diabetes

This section should be read in conjunction with the NICE guideline Antenatal care. Routine care for the healthy pregnant woman.

Monitoring Blood Glucose

Advise pregnant women with type 1 diabetes to test their fasting, pre-meal, 1-hour post-meal and bedtime blood glucose levels daily during pregnancy. [new 2015]

Advise pregnant women with type 2 diabetes or gestational diabetes who are on a multiple daily insulin injection regimen to test their fasting, pre-meal, 1-hour post-meal and bedtime blood glucose levels daily during pregnancy. [new 2015]

Advise pregnant women with type 2 diabetes or gestational diabetes to test their fasting and 1-hour post-meal blood glucose levels daily during pregnancy if they are:

- On diet and exercise therapy or
- Taking oral therapy (with or without diet and exercise therapy) or single-dose intermediate-acting or long-acting insulin [new 2015]

Target Blood Glucose Levels

Agree individualised targets for self-monitoring of blood glucose with women with diabetes in pregnancy, taking into account the risk of hypoglycaemia. [2008]

Advise pregnant women with any form of diabetes to maintain their capillary plasma glucose below the following target levels, if these are achievable without causing problematic hypoglycaemia:

- Fasting: 5.3 mmol/litre and
- 1 hour after meals: 7.8 mmol/litre or
- 2 hours after meals: 6.4 mmol/litre [new 2015]

Advise pregnant women with diabetes who are on insulin or glibenclamide to maintain their capillary plasma glucose level above 4 mmol/litre. [new 2015]

Monitoring HbA1c

Measure HbA1c levels in all pregnant women with pre-existing diabetes at the booking appointment to determine the level of risk for the pregnancy. [new 2015]

Consider measuring HbA1c levels in the second and third trimesters of pregnancy for women with pre-existing diabetes to assess the level of risk for the pregnancy. [new 2015]

Be aware that level of risk for the pregnancy for women with pre-existing diabetes increases with an HbA1c level above 48 mmol/mol (6.5%). [new 2015]

Measure HbA1c levels in all women with gestational diabetes at the time of diagnosis to identify those who may have pre-existing type 2 diabetes. [new 2015]

Do not use HbA1c levels routinely to assess a woman's blood glucose control in the second and third trimesters of pregnancy. [2008]

Managing Diabetes During Pregnancy

Insulin Treatment and Risks of Hypoglycaemia

Be aware that the rapid-acting insulin analogues (aspart and lispro) have advantages over soluble human insulin during pregnancy and consider their use. [2008]

Advise women with insulin-treated diabetes of the risks of hypoglycaemia and impaired awareness of hypoglycaemia in pregnancy, particularly in the first trimester. [2008]

Advise pregnant women with insulin-treated diabetes to always have available a fast-acting form of glucose (for example, dextrose tablets or glucose-containing drinks). [2008, amended 2015]

Provide glucagon to pregnant women with type 1 diabetes for use if needed. Instruct the woman and her partner or other family members in its use. [2008, amended 2015]

Offer women with insulin-treated diabetes continuous subcutaneous insulin infusion (CSII; also known as insulin pump therapy) during pregnancy if adequate blood glucose control is not obtained by multiple daily injections of insulin without significant disabling hypoglycaemia⁷. [2008]

Continuous Glucose Monitoring

Do not offer continuous glucose monitoring routinely to pregnant women with diabetes. [new 2015]

Consider continuous glucose monitoring for pregnant women on insulin therapy:

- Who have problematic severe hypoglycaemia (with or without impaired awareness of hypoglycaemia) or
- Who have unstable blood glucose levels (to minimise variability) or
- To gain information about variability in blood glucose levels [new 2015]

Ensure that support is available for pregnant women who are using continuous glucose monitoring from a member of the joint diabetes and antenatal care team with expertise in its use. [new 2015]

Ketone Testing and Diabetic Ketoacidosis

Offer pregnant women with type 1 diabetes blood ketone testing strips and a meter, and advise them to test for ketonaemia and to seek urgent medical advice if they become hyperglycaemic or unwell. [new 2015]

Advise pregnant women with type 2 diabetes or gestational diabetes to seek urgent medical advice if they become hyperglycaemic or unwell. [new

2015]

Test urgently for ketonaemia if a pregnant woman with any form of diabetes presents with hyperglycaemia or is unwell, to exclude diabetic ketoacidosis. [new 2015]

During pregnancy, admit immediately women who are suspected of having diabetic ketoacidosis for level 2 critical care⁸, where they can receive both medical and obstetric care. [2008]

Retinal Assessment during Pregnancy

Offer pregnant women with pre-existing diabetes retinal assessment by digital imaging with mydriasis using tropicamide following their first antenatal clinic appointment (unless they have had a retinal assessment in the last 3 months), and again at 28 weeks. If any diabetic retinopathy is present at booking, perform an additional retinal assessment at 16 to 20 weeks. [2008, amended 2015]

Diabetic retinopathy should not be considered a contraindication to rapid optimisation of blood glucose control in women who present with a high HbA1c in early pregnancy. [2008]

Ensure that women who have proliferative diabetic retinopathy or any form of referable retinopathy diagnosed during pregnancy have ophthalmological follow-up for at least 6 months after the birth of the baby. [2008, amended 2015]

Diabetic retinopathy should not be considered a contraindication to vaginal birth. [2008]

Renal Assessment during Pregnancy

If renal assessment has not been undertaken in the preceding 3 months in women with pre-existing diabetes, arrange it at the first contact in pregnancy. If the serum creatinine is abnormal (120 micromol/litre or more), the urinary albumin:creatinine ratio is greater than 30 mg/mmol or total protein excretion exceeds 2 g/day, referral to a nephrologist should be considered (eGFR should not be used during pregnancy).

Thromboprophylaxis should be considered for women with proteinuria above 5 g/day (macroalbuminuria). [2008, amended 2015]

Preventing Pre-eclampsia

For guidance on using antiplatelet agents to reduce the risk of pre-eclampsia in pregnant women with diabetes, see recommendations in the NICE guideline Hypertension in pregnancy. The management of hypertensive disorders during pregnancy. [new 2015]

Detecting Congenital Malformations

Offer women with diabetes an ultrasound scan for detecting fetal structural abnormalities, including examination of the fetal heart (4 chambers, outflow tracts and 3 vessels), at 20 weeks. [2008, amended 2015]

Monitoring Fetal Growth and Wellbeing

Offer pregnant women with diabetes ultrasound monitoring of fetal growth and amniotic fluid volume every 4 weeks from 28 to 36 weeks. [2008]

Routine monitoring of fetal wellbeing (using methods such as fetal umbilical artery Doppler recording, fetal heart rate recording and biophysical profile testing) before 38 weeks is not recommended in pregnant women with diabetes, unless there is a risk of fetal growth restriction. [2008, amended 2015]

Provide an individualised approach to monitoring fetal growth and wellbeing for women with diabetes and a risk of fetal growth restriction (macrovascular disease and/or nephropathy). [2008, amended 2015]

Organisation of Antenatal Care

Offer immediate contact with a joint diabetes and antenatal clinic to women with diabetes who are pregnant. [2008]

Ensure that women with diabetes have contact with the joint diabetes and antenatal clinic for assessment of blood glucose control every 1 to 2 weeks throughout pregnancy. [2008, amended 2015]

At antenatal appointments, provide care specifically for women with diabetes, in addition to the care provided routinely for healthy pregnant women (see the NICE guideline Antenatal care. Routine care for the healthy pregnancy woman). The table below describes how care for women with diabetes differs from routine antenatal care. At each appointment, offer the woman ongoing opportunities for information and education. [2008, amended 2015]

Table. Timetable of Antenatal Appointments

Appointment	Care for Women with Diabetes during Pregnancy*
Booking appointment (joint diabetes and antenatal care) – ideally by 10 weeks	<p>Discuss information, education and advice about how diabetes will affect the pregnancy, birth and early parenting (such as breastfeeding and initial care of the baby).</p> <p>If the woman has been attending for preconception care and advice, continue to provide information, education and advice in relation to achieving optimal blood glucose control (including dietary advice).</p> <p>If the woman has not attended for preconception care and advice, give information, education and advice for the first time, take a clinical history to establish the extent of diabetes-related complications (including neuropathy and vascular disease), and review medicines for diabetes and its complications.</p> <p>Offer retinal assessment for women with pre-existing diabetes unless the woman has been assessed in the last 3 months.</p> <p>Offer renal assessment for women with pre-existing diabetes if this has not been performed in the last 3 months.</p> <p>Arrange contact with the joint diabetes and antenatal clinic every 1 to 2 weeks throughout pregnancy for all women with diabetes.</p> <p>Measure HbA1c levels for women with pre-existing diabetes to determine the level of risk for the pregnancy.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the first trimester.</p> <p>Confirm viability of pregnancy and gestational age at 7 to 9 weeks.</p>
16 weeks	<p>Offer retinal assessment at 16 to 20 weeks to women with pre-existing diabetes if diabetic retinopathy was present at their first antenatal clinic visit.</p> <p>Offer self-monitoring of blood glucose or a 75 g 2-hour OGTT as soon as possible for women with a history of gestational diabetes who book in the second trimester.</p>
20 weeks	Offer an ultrasound scan for detecting fetal structural abnormalities, including examination of the fetal heart (4 chambers, outflow tracts and 3 vessels).
28 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer retinal assessment to all women with pre-existing diabetes.</p> <p>Women diagnosed with gestational diabetes as a result of routine antenatal testing at 24 to 28 weeks enter the care pathway.</p>
32 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Offer nulliparous women all routine investigations normally scheduled for 31 weeks in routine antenatal care.</p>
34 weeks	No additional or different care for women with diabetes.
36 weeks	<p>Offer ultrasound monitoring of fetal growth and amniotic fluid volume.</p> <p>Provide information and advice about:</p> <ul style="list-style-type: none"> • Timing, mode and management of birth • Analgesia and anaesthesia • Changes to blood glucose-lowering therapy during and after birth

Appointment	<ul style="list-style-type: none"> • Care of the baby after birth
	<ul style="list-style-type: none"> • Care for Women with Diabetes during Pregnancy* • Initiation of breastfeeding and the effect of breastfeeding on blood glucose control • Contraception and follow-up
37 ⁺⁰ weeks to 38 ⁺⁶ weeks	Offer induction of labour, or caesarean section if indicated, to women with type 1 or type 2 diabetes; otherwise await spontaneous labour.
38 weeks	Offer tests of fetal wellbeing.
39 weeks	Offer tests of fetal wellbeing. Advise women with uncomplicated gestational diabetes to give birth no later than 40 ⁺⁶ weeks.
<p>*Women with diabetes should also receive routine care according to the schedule of appointments in the NICE guideline Antenatal care. Routine care for the healthy pregnancy woman, including appointments at 25 weeks (for nulliparous women) and 34 weeks, but with the exception of the appointment for nulliparous women at 31 weeks.</p> <p>HbA1c = haemoglobin A1c; OGTT = oral glucose tolerance test.</p>	

Preterm Labour in Women with Diabetes

Diabetes should not be considered a contraindication to antenatal steroids for fetal lung maturation or to tocolysis. [2008]

In women with insulin-treated diabetes who are receiving steroids for fetal lung maturation, give additional insulin according to an agreed protocol and monitor them closely. [2008, amended 2015]

Do not use betamimetic medicines for tocolysis in women with diabetes. [2008]

Intrapartum Care

Timing and Mode of Birth

Discuss the timing and mode of birth with pregnant women with diabetes during antenatal appointments, especially during the third trimester. [new 2015]

Advise pregnant women with type 1 or type 2 diabetes and no other complications to have an elective birth by induction of labour, or by elective caesarean section if indicated, between 37⁺⁰ weeks and 38⁺⁶ weeks of pregnancy. [new 2015]

Consider elective birth before 37⁺⁰ weeks for women with type 1 or type 2 diabetes if there are metabolic or any other maternal or fetal complications. [new 2015]

Advise women with gestational diabetes to give birth no later than 40⁺⁶ weeks, and offer elective birth (by induction of labour, or by caesarean section if indicated) to women who have not given birth by this time. [new 2015]

Consider elective birth before 40⁺⁶ weeks for women with gestational diabetes if there are maternal or fetal complications. [new 2015]

Diabetes should not in itself be considered a contraindication to attempting vaginal birth after a previous caesarean section. [2008]

Explain to pregnant women with diabetes who have an ultrasound-diagnosed macrosomic fetus about the risks and benefits of vaginal birth, induction of labour and caesarean section. [2008]

Anaesthesia

Offer women with diabetes and comorbidities such as obesity or autonomic neuropathy an anaesthetic assessment in the third trimester of pregnancy. [2008]

If general anaesthesia is used for the birth in women with diabetes, monitor blood glucose every 30 minutes from induction of general anaesthesia until after the baby is born and the woman is fully conscious. [2008]

Blood Glucose Control during Labour and Birth

Monitor capillary plasma glucose every hour during labour and birth in women with diabetes, and ensure that it is maintained between 4 and 7 mmol/litre. [2008, amended 2015]

Intravenous dextrose and insulin infusion should be considered for women with type 1 diabetes from the onset of established labour. [2008]

Use intravenous dextrose and insulin infusion during labour and birth for women with diabetes whose capillary plasma glucose is not maintained between 4 and 7 mmol/litre. [2008, amended 2015]

Neonatal Care

Initial Assessment and Criteria for Admission to Intensive or Special Care

Advise women with diabetes to give birth in hospitals where advanced neonatal resuscitation skills are available 24 hours a day. [2008]

Babies of women with diabetes should stay with their mothers unless there is a clinical complication or there are abnormal clinical signs that warrant admission for intensive or special care. [2008]

Carry out blood glucose testing routinely in babies of women with diabetes at 2 to 4 hours after birth. Carry out blood tests for polycythaemia, hyperbilirubinaemia, hypocalcaemia and hypomagnesaemia for babies with clinical signs. [2008]

Perform an echocardiogram for babies of women with diabetes if they show clinical signs associated with congenital heart disease or cardiomyopathy, including heart murmur. The timing of the examination will depend on the clinical circumstances. [2008]

Admit babies of women with diabetes to the neonatal unit if they have:

- Hypoglycaemia associated with abnormal clinical signs
- Respiratory distress
- Signs of cardiac decompensation from congenital heart disease or cardiomyopathy
- Signs of neonatal encephalopathy
- Signs of polycythaemia and are likely to need partial exchange transfusion
- Need for intravenous fluids
- Need for tube feeding (unless adequate support is available on the postnatal ward)
- Jaundice requiring intense phototherapy and frequent monitoring of bilirubinaemia
- Been born before 34 weeks (or between 34 and 36 weeks if dictated clinically by the initial assessment of the baby and feeding on the labour ward) [2008]

Do not transfer babies of women with diabetes to community care until they are at least 24 hours old, and not before you are satisfied that the baby is maintaining blood glucose levels and is feeding well. [2008]

Preventing and Assessing Neonatal Hypoglycaemia

All maternity units should have a written policy for the prevention, detection and management of hypoglycaemia in babies of women with diabetes. [2008]

Test the blood glucose of babies of women with diabetes using a quality-assured method validated for neonatal use (ward-based glucose electrode or laboratory analysis). [2008]

Women with diabetes should feed their babies as soon as possible after birth (within 30 minutes) and then at frequent intervals (every 2 to 3 hours) until feeding maintains pre-feed capillary plasma glucose levels at a minimum of 2.0 mmol/litre. [2008, amended 2015]

If capillary plasma glucose values are below 2.0 mmol/litre on 2 consecutive readings despite maximal support for feeding, if there are abnormal clinical signs or if the baby will not feed orally effectively, use additional measures such as tube feeding or intravenous dextrose. Only implement additional measures if one or more of these criteria are met. [2008, amended 2015]

Test blood glucose levels in babies of women with diabetes who present with clinical signs of hypoglycaemia, and treat those who are hypoglycaemic with intravenous dextrose as soon as possible. [2008, amended 2015]

Postnatal Care

Blood Glucose Control, Medicines and Breastfeeding

Women with insulin-treated pre-existing diabetes should reduce their insulin immediately after birth and monitor their blood glucose levels carefully

to establish the appropriate dose. [2008]

Explain to women with insulin-treated pre-existing diabetes that they are at increased risk of hypoglycaemia in the postnatal period, especially when breastfeeding, and advise them to have a meal or snack available before or during feeds. [2008]

Women who have been diagnosed with gestational diabetes should discontinue blood glucose-lowering therapy immediately after birth. [2008]

Women with pre-existing type 2 diabetes who are breastfeeding can resume or continue to take metformin³ and glibenclamide⁶ immediately after birth, but should avoid other oral blood glucose-lowering agents while breastfeeding. [2008]

Women with diabetes who are breastfeeding should continue to avoid any medicines for the treatment of diabetes complications that were discontinued for safety reasons in the preconception period. [2008]

Information and Follow-up after Birth

Women with Pre-Existing Diabetes

Refer women with pre-existing diabetes back to their routine diabetes care arrangements. [2008]

Remind women with diabetes of the importance of contraception and the need for preconception care when planning future pregnancies. [2008]

Women Diagnosed with Gestational Diabetes

Test blood glucose in women who were diagnosed with gestational diabetes to exclude persisting hyperglycaemia before they are transferred to community care. [2008]

Remind women who were diagnosed with gestational diabetes of the symptoms of hyperglycaemia. [2008]

Explain to women who were diagnosed with gestational diabetes about the risks of gestational diabetes in future pregnancies, and offer them testing for diabetes⁹ when planning future pregnancies. [2008, amended 2015]

For women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal after the birth:

- Offer lifestyle advice (including weight control, diet and exercise).
- Offer a fasting plasma glucose test 6 to 13 weeks after the birth to exclude diabetes (for practical reasons this might take place at the 6-week postnatal check).
- If a fasting plasma glucose test has not been performed by 13 weeks, offer a fasting plasma glucose test, or an HbA1c test if a fasting plasma glucose test is not possible, after 13 weeks.
- Do not routinely offer a 75 g 2-hour OGTT. [new 2015]

For women having a fasting plasma glucose test as the postnatal test:

- Advise women with a fasting plasma glucose level below 6.0 mmol/litre that:
 - They have a low probability of having diabetes at present
 - They should continue to follow the lifestyle advice (including weight control, diet and exercise) given after the birth
 - They will need an annual test to check that their blood glucose levels are normal
 - They have a moderate risk of developing type 2 diabetes, and offer them advice and guidance in line with the NICE guideline [Preventing type 2 diabetes](#) [10].
- Advise women with a fasting plasma glucose level between 6.0 and 6.9 mmol/litre that they are at high risk of developing type 2 diabetes, and offer them advice, guidance and interventions in line with the NICE guideline [Preventing type 2 diabetes](#) [10].
- Advise women with a fasting plasma glucose level of 7.0 mmol/litre or above that they are likely to have type 2 diabetes, and offer them a diagnostic test to confirm diabetes. [new 2015]

For women having an HbA1c test as the postnatal test:

- Advise women with an HbA1c level below 39 mmol/mol (5.7%) that:
 - They have a low probability of having diabetes at present
 - They should continue to follow the lifestyle advice (including weight control, diet and exercise) given after the birth
 - They will need an annual test to check that their blood glucose levels are normal
 - They have a moderate risk of developing type 2 diabetes, and offer them advice and guidance in line with the NICE guideline

Preventing type 2 diabetes [redacted]¹⁰.

- Advise women with an HbA1c level between 39 and 47 mmol/mol (5.7% and 6.4%) that they are at high risk of developing type 2 diabetes, and offer them advice, guidance and interventions in line with the NICE guideline [Preventing type 2 diabetes](#) [redacted]¹⁰.
- Advise women with an HbA1c level of 48 mmol/mol (6.5%) or above that they have type 2 diabetes and refer them for further care. [new 2015]

Offer an annual HbA1c test to women who were diagnosed with gestational diabetes who have a negative postnatal test for diabetes. [new 2015]

Offer women who were diagnosed with gestational diabetes early self-monitoring of blood glucose or an OGTT in future pregnancies. Offer a subsequent OGTT if the first OGTT results in early pregnancy are normal (see recommendation above). [2008, amended 2015]

Footnotes

¹Glycated haemoglobin (HbA1c) values are reported in mmol/mol, using the [International Federation of Clinical Chemistry and Laboratory Medicine \(IFCC\) standardised HbA1c test](#) [redacted]. The equivalent values in %, using the Diabetes Control and Complications Trial (DCCT)-aligned HbA1c test, are reported in parentheses.

²Because of a lack of evidence on plasma glucose targets for women with diabetes who are planning pregnancy, target ranges will be taken from the updated NICE guideline on [Type 1 diabetes](#) [redacted] (consultation 10 December 2014 to 4 March 2015). This recommendation will be replaced by one containing the target ranges when the type 1 diabetes guideline update is published (expected August 2015).

³Although metformin is commonly used in UK clinical practice in the management of diabetes in pregnancy and lactation, and there is strong evidence for its effectiveness and safety (presented in the full version of the guideline), at the time of publication (February 2015) metformin did not have a UK marketing authorisation for this indication. The summary of product characteristics advises that when a patient plans to become pregnant and during pregnancy, diabetes should not be treated with metformin but insulin should be used to maintain blood glucose levels. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#) [redacted] for further information.

⁴At the time of publication (February 2015), long-acting insulin analogues did not have UK marketing authorisation for use during pregnancy in women with diabetes. However, the summaries of product characteristics (SPCs) for insulin detemir and insulin glargine state that their use may be considered during pregnancy; see the SPCs of the individual products for details. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#) [redacted] for further information.

⁵The recommendations in NICE technology appraisal guidance 60 relating to type 2 diabetes have been replaced by recommendations in the NICE guideline on [Type 2 diabetes](#) [redacted] (update currently under way; publication expected August 2015). The recommendations in TA60 relating to type 1 diabetes will be replaced by new recommendations in the updated NICE guideline on [Type 1 diabetes](#) [redacted] (update currently under way; consultation 10 December 2014 to 4 March 2015; publication expected August 2015).

⁶At the time of publication (February 2015) glibenclamide was contraindicated for use up to gestational week 11 and did not have UK marketing authorisation for use during the second and third trimesters of pregnancy in women with gestational diabetes. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#) [redacted] for further information.

⁷For the purpose of this guidance, 'disabling hypoglycaemia' means the repeated and unpredicted occurrence of hypoglycaemia requiring third-party assistance that results in continuing anxiety about recurrence and is associated with significant adverse effect on quality of life.

⁸Level 2 critical care is defined as care for patients requiring detailed observation or intervention, including support for a single failing organ system or postoperative care and those 'stepping down' from higher levels of care.

⁹See [Use of HbA1c in the diagnosis of diabetes mellitus: abbreviated report of a WHO consultation](#) [redacted] (2011).

¹⁰Note that the threshold for defining a moderate risk of developing type 2 diabetes postnatally for women who have had gestational diabetes is different from that given in NICE guideline [Preventing type 2 diabetes](#) , because of the different populations.

Definitions

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group (GDG) makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the GDG is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The GDG usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally the GDG uses 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The GDG uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. Similar forms of words (for example, 'Do not offer...') are used when the GDG is confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The GDG uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Recommendation Wording in Guideline Updates

NICE began using this approach to denote the strength of recommendations in guidelines that started development after publication of the 2009 version of "The guidelines manual" (January 2009). This does not apply to any recommendations ending [2008]. In particular, for recommendations labelled [2008] the word 'consider' may not necessarily be used to denote the strength of the recommendation.

Clinical Algorithm(s)

A care pathway for diabetes in pregnancy is provided in the full version of the guideline (see the "Availability of Companion Documents" field).

In addition, a National Institute for Health and Care Excellence (NICE) pathway titled "Diabetes in Pregnancy Overview" is available from the [NICE Web site](#) .

Scope

Disease/Condition(s)

- Type 1 diabetes mellitus
- Type 2 diabetes mellitus
- Gestational diabetes mellitus
- Diabetic complications
- Pregnancy

Guideline Category

Counseling

Diagnosis

Evaluation

Management

Prevention

Risk Assessment

Screening

Treatment

Clinical Specialty

Endocrinology

Family Practice

Internal Medicine

Nursing

Obstetrics and Gynecology

Pediatrics

Intended Users

Advanced Practice Nurses

Allied Health Personnel

Nurses

Other

Patients

Physician Assistants

Physicians

Public Health Departments

Guideline Objective(s)

To provide recommendations for managing diabetes and its complications in women who are planning pregnancy and those who are already pregnant

Target Population

Women who are planning pregnancy or are already pregnant

Interventions and Practices Considered

1. Preconception planning and care
 - Providing women with information about outcomes and risks for mother and baby
 - Providing women with education on the importance of planning pregnancy and the role of contraception
 - Offering advice about diet, dietary supplements, and body weight
 - Monitoring blood glucose and ketones in the preconception period
 - Agreeing on target blood glucose and glycated haemoglobin (HbA1c) levels in the preconception period
 - Ensuring safe use of medicines for diabetes before and during pregnancy (e.g., use of metformin, discontinuing other oral blood glucose-lowering agents, use of insulin and insulin analogues)
 - Ensuring safe use of medicines for complications of diabetes before and during pregnancy (e.g., discontinuing angiotensin-converting enzyme inhibitors and angiotensin-II receptor antagonists and statins)
 - Removing barriers to the uptake of preconception care and consideration of when to offer information
 - Structured education programs
 - Retinal and renal assessments in the preconception period
2. Gestational diabetes
 - Risk assessment for gestational diabetes
 - Detecting glycosuria
 - 2-hour 75 g oral glucose tolerance test (OGTT)
 - Early self-monitoring of blood glucose
 - Fasting blood glucose
 - Providing advice about diet and exercise at time of diagnosis of gestational diabetes
 - Use of metformin therapy
 - Use of insulin therapy with or without metformin
 - Use of glibenclamide therapy
3. Antenatal care for women with diabetes
 - Providing advice on monitoring blood glucose
 - Agreeing on individualised targets for blood glucose levels
 - Monitoring HbA1c
 - Insulin treatment and managing hypoglycaemia
 - Use of continuous glucose monitoring as needed
 - Ketone testing and providing advice on diabetic ketoacidosis
 - Retinal assessment during pregnancy
 - Renal assessment during pregnancy
 - Preventing pre-eclampsia (guidance on using antiplatelet agents)
 - Detecting congenital malformations (ultrasound)
 - Monitoring fetal growth and wellbeing
 - Organisation of antenatal care
 - Timetable of antenatal appointments
 - Managing preterm labour (use of antenatal steroids, avoiding use of betamimetics)
4. Intrapartum care
 - Discussion and advice on timing and mode of birth (e.g., vaginal birth, induction of labour, elective caesarean section)
 - Anaesthesia considerations during birth
 - Blood glucose control during labour and birth
5. Neonatal care
 - Initial assessment and criteria for admission to intensive or special care
 - Preventing and assessing neonatal hypoglycaemia
6. Postnatal care
 - Blood glucose control, medicine use, and breastfeeding
 - Providing information and follow-up after birth

Major Outcomes Considered

- Diagnostic accuracy (sensitivity and specificity)
- Health-related quality of life (validated questionnaire)
- Maternal outcomes

- Worsening of retinopathy and/or nephropathy
- Incidence of dyslipidaemia
- Glycaemic control measured by glycated haemoglobin (HbA1c) values
- Venous thromboembolic disease
- Arterial thromboembolic disease
- Hypertension
- Maternal mortality
- Preterm birth
- Non-routine hospital contact or assessment for ketosis including phone contact
- Hospital admission for diabetic ketoacidosis
- Maternal satisfaction
- Hypoglycaemic episodes
- Spontaneous miscarriage
- Acceptability/take up of targets, testing regimen or treatment
- Pre-eclampsia
- Mode of birth (spontaneous vaginal, operative vaginal, caesarean section [elective or emergency])
- Need for additional treatment for gestational diabetes, such as diet, oral hypoglycaemic agents or insulin
- Severe hypoglycaemic episodes
- Maternal complications of delivery
- Incidence of gestational diabetes and of impaired fasting glucose (IFG), impaired glucose tolerance (IGT) and diabetes in women postnatally
- Accuracy in detecting gestational diabetes and IFG, IGT or diabetes in women postnatally
- Neonatal outcomes
 - Stillbirth, perinatal, and neonatal death
 - Neonatal intensive care unit (NICU) length of stay greater than 24 hours
 - Admission to NICU
 - Neonatal hypoglycaemia
 - Neonatal hyperinsulinaemia or hyper C-peptideaemia
 - Any congenital abnormality, regardless of gestational age
 - Large for gestational age
 - Macrosomia
 - Shoulder dystocia (with and without consequences for the baby such as trauma, neuromuscular injury)
 - Initiation of breastfeeding (when started and exclusivity)
- Cost effectiveness

Methodology

Methods Used to Collect/Select the Evidence

Searches of Electronic Databases

Description of Methods Used to Collect/Select the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health (NCC-WCH) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Developing Review Questions and Protocols and Identifying Evidence

The scope for this guideline (see Appendix A in the full guideline appendices) outlines the main areas where guidance is needed. The Guideline Development Group (GDG) formulated review questions based on the scope and prepared a protocol for each review question (see Appendices C and D of the full version of the guideline). These formed the starting point for systematic reviews of relevant evidence.

Published evidence was identified by applying systematic search strategies to the following databases: Medline (1946 onwards), EMBASE (1974 onwards) and 4 Cochrane databases (Cochrane Central Register of Controlled Trials, Cochrane Database of Systematic Reviews, the Database of Abstracts of Reviews of Effects and the Health Technology Assessment [HTA] database). Searches to identify economic studies were undertaken using the above databases and the National Health Service Economic Evaluation Database (NHS EED). The Cumulative Index to Nursing and Allied Health Literature (CINAHL; 1980 onwards) was searched for selected topics only. Where possible, searches were limited to English-language only. Generic and specially developed search filters were used to identify particular study designs, such as randomised controlled trials (RCTs). There was no systematic attempt to search grey literature (conference abstracts, theses or unpublished trials), nor was hand searching of journals not indexed on the databases undertaken.

Towards the end of the guideline development process, all searches were updated and re-executed within 6 to 8 weeks of the start of the stakeholder consultation to ensure the reviews were up-to-date. This process was completed by June 2014.

Number of Source Documents

See Appendix F: Summary of Identified Studies (see the "Availability of Companion Documents" field) for detailed information on results of literature searches and number of included studies for each review question for the 2015 update.

Methods Used to Assess the Quality and Strength of the Evidence

Weighting According to a Rating Scheme (Scheme Given)

Rating Scheme for the Strength of the Evidence

Overall Quality of Outcome Evidence in Grading of Recommendations Assessment, Development and Evaluation (GRADE)

Level	Description
High	Further research is very unlikely to change confidence in the estimate of effect.
Moderate	Further research is likely to have an important impact on confidence in the estimate of effect and may change the estimate.
Low	Further research is very likely to have an important impact on confidence in the estimate of effect and is likely to change the estimate.
Very Low	Any estimate of effect is very uncertain.

Methods Used to Analyze the Evidence

Meta-Analysis

Review of Published Meta-Analyses

Systematic Review with Evidence Tables

Description of the Methods Used to Analyze the Evidence

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health (NCC-WCH) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Reviewing and Synthesising Evidence

The type of review question determines the highest level of evidence that may be sought. For issues of therapy or treatment, the highest possible evidence level is a well-conducted systematic review or meta-analysis of randomised controlled trials (RCTs), or an individual RCT. In the Grading

of Recommendations Assessment, Development and Evaluation (GRADE) approach (see <http://www.gradeworkinggroup.org>

), a body of evidence based entirely on such studies has an initial quality rating of high, and this may be downgraded to moderate, low or very low if factors listed above are not addressed adequately.

For issues of diagnosis, the highest possible level of evidence is a controlled prospective observational study (a cohort study or case-control study), and a body of evidence based on such studies would have an initial quality rating of high, which might be downgraded to moderate, low or very low, depending on the factors listed above. A retrospective observational study and a body of evidence based on such studies would have an initial quality rating of moderate, which might be downgraded to low or very low, or upgraded to high, depending on the factors listed above.

For each review question the highest available level of evidence was sought. Where appropriate, for example, if a systematic review, meta-analysis or RCT was identified to answer a question directly, studies of a weaker design were not considered. Where systematic reviews, meta-analyses and RCTs were not identified, other appropriate experimental or observational studies were sought. For diagnostic tests, test evaluation studies examining the performance of the test were used if the accuracy of the test was required, but where an evaluation of the effectiveness of the test in the clinical management of the condition was required, evidence from RCTs or cohort studies was optimal.

Some studies were excluded from the guideline reviews after obtaining copies of the corresponding publications (see Appendix G in the full guideline appendices) because they did not meet inclusion criteria specified by the Guideline Development Group (GDG) in the review protocols (see Appendix D in the full version of the guideline). The characteristics of each included study were summarised in evidence tables for each review question (see Appendix H in the full guideline appendices).

The body of evidence identified for each review question was reviewed and synthesised according to the GRADE approach and presented in the form of a GRADE evidence profile summarising the quality of the evidence and the findings for each outcome (relative and absolute effect sizes and associated confidence intervals [CIs]).

The review questions were judged on a number of outcomes. The justification for using these outcomes was based on their relevance to the populations covered by the guideline and consensus among members of the GDG. Outcomes included those that would confer benefit to the woman or her baby, as well as unwanted effects of treatment that would be important to reduce to a minimum. The outcomes are listed in the "Major Outcomes Considered" field. When assessing the effectiveness of a particular intervention in each review, appropriate information about the effect on one or more primary outcomes was sought.

In the GRADE approach, the quality of the evidence identified for each outcome listed in the review protocol is assessed according to the factors listed below, and an overall quality rating (high, moderate, low or very low) is assigned by combining the ratings for the individual factors.

- Study design (as an indicator of intrinsic bias; this determines the initial quality rating)
- Limitations in the design or execution of the study (including concealment of allocation, blinding, loss to follow up; these can reduce the quality rating)
- Inconsistency of effects across studies (this can reduce the quality rating)
- Indirectness (the extent to which the available evidence fails to address the specific review question; this can reduce the quality rating)
- Imprecision (this can reduce the quality rating)
- Other considerations (including large magnitude of effect, evidence of a dose–response relationship, or confounding variables likely to have reduced the magnitude of an effect; these can increase the quality rating in observational studies, provided no downgrading for other features has occurred)

The GRADE approach covers studies of treatment effectiveness. However, it is less well established for studies reporting accuracy of diagnostic tests. All studies were assessed for limitations using methodology checklists available in the NICE Guidelines Manual 2012 including the Quality Assessment of Studies of Diagnostic Accuracy (QUADAS) methodology checklist to assess quality of diagnostic studies.

Within the GRADE system it is necessary to predetermine values for minimum important differences in outcomes. For categorical outcomes the GRADE default of ± 0.25 for risk ratios and odds ratios was used. For continuous outcomes, the GDG was asked to predefine minimally important differences (the smallest difference between treatments that healthcare professionals or patients think is clinically beneficial). However, the Group was unable to agree these, so continuous variables were graded based on a statistically derived minimum important difference (see Cochrane Handbook, Section 7.7.3.8). The minimally important differences derived for continuous outcomes are noted in Appendix I in the full guideline appendices. A dichotomous outcome result was considered precise if the CI for the point estimate was below a threshold of 0.75, was between 0.75 and 1.25 or was above 1.25. If the CI crossed either of the 0.75 or 1.25 thresholds the result was considered as seriously imprecise and downgraded. If the CI crossed both thresholds, the result was considered as very seriously imprecise and downgraded by 2 grades. Continuous outcomes were downgraded if the confidence interval for the mean or mean difference crossed the line of no effect and the minimally important difference (50% of the combined standard deviation of the 2 groups at baseline).

Where possible, dichotomous outcomes were presented as relative risks (RRs) or odds ratios (ORs) with 95% CIs, and continuous outcomes were presented as mean differences with 95% CIs or means with standard deviations (SDs). For studies evaluating the accuracy of a diagnostic test, sensitivity, specificity and likelihood ratios for positive and negative test results (LR+ and LR–, respectively) were calculated or quoted where possible (see Table 6 in the full version of the guideline).

Where possible, the body of evidence corresponding to each outcome specified in the review protocol was subjected to quantitative meta-analysis. In such cases, pooled effect sizes were presented as pooled RRs, pooled ORs or weighted mean differences. By default, meta-analyses were conducted by fitting fixed effects models, but where statistically significant heterogeneity was identified, random effects models were used. Where quantitative meta-analysis could not be undertaken (for example because of heterogeneity in the included studies), the effect sizes reported in the included studies were presented for each individual study.

Assessing Cost-effectiveness

The aims of the health economic input to the guideline were to inform the GDG of potential economic issues relating to diabetes in pregnancy, and to ensure that recommendations represented a cost-effective use of healthcare resources. Health economic evaluations aim to integrate data on benefits (ideally in terms of quality adjusted life years [QALYs]), harms and costs of different care options.

The GDG prioritised a number of review questions where it was thought that economic considerations would be particularly important in formulating recommendations. A single global systematic search for published economic evidence was undertaken to cover all clinical questions in the guideline. For economic evaluations, no standard system of grading the quality of evidence exists and included papers were assessed using a quality assessment checklist based on good practice in economic evaluation. Reviews of the relevant published health economic literature are presented in the health economics chapter (Chapter 9) in the full version of the guideline.

Health economic considerations were aided by original economic analysis undertaken as part of the development process. For this guideline the areas prioritised for possible economic analysis were:

- First trimester screening for glucose intolerance
- Screening for gestational diabetes at 24 to 28 weeks
- Diagnostic thresholds for gestational diabetes
- Treatment of gestational diabetes
- The effectiveness of continuous glucose monitoring
- Specialist teams for pregnant women with diabetes
- The gestational age-specific risk of intrauterine death and optimal timing of birth
- Postnatal testing and optimal timing after pregnancy

However, it was not possible to undertake original analyses for all these areas. In some areas the clinical evidence was such that modelling was not needed to aid recommendations. For other areas it was possible to make an assessment as to likely cost-effectiveness without recourse to a model.

A model was developed to assess several alternative diagnostic thresholds for gestational diabetes. It was also possible to use this model to compare NICE risk factor screening against a policy of universal screening. Patient level data was also used to compare the cost-effectiveness of NICE risk factor screening against other biochemical screening tests.

Methods Used to Formulate the Recommendations

Expert Consensus

Informal Consensus

Description of Methods Used to Formulate the Recommendations

Note from the National Guideline Clearinghouse (NGC): This guideline was developed by the National Collaborating Centre for Women's and Children's Health (NCC-WCH) on behalf of the National Institute for Health and Care Excellence (NICE). See the "Availability of Companion Documents" field for the full version of this guidance and related appendices.

Evidence to Recommendations

For each review question recommendations for clinical care were derived using, and linked explicitly to, the evidence that supported them. In the first instance, informal consensus methods were used by the Guideline Development Group (GDG) to agree short clinical (and, where appropriate, cost effectiveness) evidence statements which were presented alongside the evidence profiles. Statements summarising the group's interpretation of the evidence and any extrapolation from the evidence used to form recommendations were also prepared to ensure transparency in the decision-making process. The criteria used in moving from evidence to recommendations were:

- Relative value placed on the outcomes considered
- Consideration of the clinical benefits and harms
- Consideration of net health benefits and resource use
- Quality of the evidence
- Other considerations (including equalities issues)

In areas where no substantial clinical research evidence was identified, the GDG considered other evidence-based guidelines and consensus statements or used their collective experience to identify good practice. The health economics justification in areas of the guideline where the use of National Health Service (NHS) resources (interventions) was considered was based on group consensus in relation to the likely cost effectiveness implications of the recommendations. The group also identified areas where evidence to answer review questions was lacking and used this information to formulate recommendations for future research.

Towards the end of the guideline development process formal consensus methods were used to consider all the clinical care recommendations and research recommendations that had been drafted previously. The GDG identified 10 'key priorities for implementation' (key recommendations) and 5 high priority research recommendations. The key priorities for implementation were those recommendations thought likely to have the biggest impact on the care of women with diabetes before, during and after pregnancy and their babies, and outcomes in the NHS as a whole; they were selected using a variant of the nominal group technique (see the NICE Guidelines Manual [see the "Availability of Companion Documents" field]). The priority research recommendations were selected in a similar way.

Rating Scheme for the Strength of the Recommendations

Strength of Recommendations

Some recommendations can be made with more certainty than others. The Guideline Development Group (GDG) makes a recommendation based on the trade-off between the benefits and harms of an intervention, taking into account the quality of the underpinning evidence. For some interventions, the GDG is confident that, given the information it has looked at, most patients would choose the intervention. The wording used in the recommendations in this guideline denotes the certainty with which the recommendation is made (the strength of the recommendation).

Interventions That Must (or Must Not) Be Used

The GDG usually uses 'must' or 'must not' only if there is a legal duty to apply the recommendation. Occasionally the GDG uses 'must' (or 'must not') if the consequences of not following the recommendation could be extremely serious or potentially life threatening.

Interventions That Should (or Should Not) Be Used – a 'Strong' Recommendation

The GDG uses 'offer' (and similar words such as 'refer' or 'advise') when confident that, for the vast majority of patients, an intervention will do more good than harm, and be cost effective. Similar forms of words (for example, 'Do not offer...') are used when the GDG is confident that an intervention will not be of benefit for most patients.

Interventions That Could Be Used

The GDG uses 'consider' when confident that an intervention will do more good than harm for most patients, and be cost effective, but other options may be similarly cost effective. The choice of intervention, and whether or not to have the intervention at all, is more likely to depend on the patient's values and preferences than for a strong recommendation, and so the healthcare professional should spend more time considering and discussing the options with the patient.

Recommendation Wording in Guideline Updates

The National Institute for Health and Care Excellence (NICE) began using this approach to denote the strength of recommendations in guidelines that started development after publication of the 2009 version of 'The guidelines manual' (January 2009). This does not apply to any recommendations ending [2008]. In particular, for recommendations labelled [2008] the word 'consider' may not necessarily be used to denote the strength of the recommendation.

Cost Analysis

Health economics profiles are summarised in the respective chapters of the full version of the guideline, following presentation of the clinical evidence. Chapter 9: Health Economics in the full version of the guideline (see the "Availability of Companion Documents" field) provides a cost-effectiveness review of the literature.

Method of Guideline Validation

External Peer Review

Internal Peer Review

Description of Method of Guideline Validation

Stakeholder Involvement

Registered stakeholder organisations were invited to comment on the draft scope and the draft guideline. The Guideline Development Group (GDG) carefully considered and responded to all comments received from stakeholder organisations. The comments and responses were reviewed by the National Institute for Health and Care Excellence (NICE) in accordance with the NICE guideline development process.

Evidence Supporting the Recommendations

Type of Evidence Supporting the Recommendations

The type of evidence supporting the recommendations is not specifically stated.

Benefits/Harms of Implementing the Guideline Recommendations

Potential Benefits

- Achieving low blood glucose values in pregnancy is associated with a lower incidence of adverse outcomes, particularly congenital malformations.
- The advantage of a positive screening test result with a subsequent positive diagnostic test is that it allows for the possibility of therapeutic intervention earlier in the pregnancy than is current normal practice and hence potentially improved outcomes. The main advantage of a correct negative screening test result is in confirming that glucose regulation in the pregnancy is normal, the reassurance that this gives to the woman and the avoidance of unnecessary interventions.
- The potential benefits of recognising and treating gestational diabetes include reductions in ill health in the woman and/or the baby during or immediately after pregnancy, as well as the benefits of reducing the risk of progression to type 2 diabetes in the longer term and/or future pregnancies being complicated by pre-existing or gestational diabetes.
- Ultrasound scanning of the fetus was acknowledged to be an intervention that could decrease the risk of high birth weight (for example by elective delivery at 38 weeks) and shoulder dystocia (for example by an elective caesarean section) in cases where a large fetus was identified.
- The benefits of screening for congenital malformations include the opportunity for counselling, enabling families time to prepare, allowing antenatal treatment, and ensuring appropriate obstetric management.
- Blood ketone tests give a specific value that more accurately reflects the level of ketosis and its severity, thus leading to more timely recognition of diabetic ketoacidosis (DKA) and earlier treatment.

See also the "Consideration of clinical benefits and harms" sections of the full version of the guideline (see the "Availability of Companion Documents" field) for details about benefits of specific interventions.

Potential Harms

- In managing diabetes during pregnancy, a balance needs to be struck between the risk to the woman of hypoglycaemia and the benefit to the embryo in the first trimester, especially in terms of organogenesis.
- A consequence of an erroneous positive screening test result for gestational diabetes is an unnecessary diagnostic test and the inconvenience and anxiety that this would cause. The Guideline Development Group (GDG) believed that when a woman receives an erroneous negative screening test there is the potential of considerable harm to her or her baby. The consequent lack of effective intervention would increase the potential likelihood of poor outcomes for the woman and her baby, including short- and long-term morbidity.
- A consequence of an erroneous positive gestational diabetes diagnosis may be unnecessary intervention to gain tighter control of glucose regulation. The GDG recognised that the clinical benefit of achieving tighter glucose control might not be outweighed by the harms caused by unnecessary intervention (for example unnecessary anxiety, additional clinical appointments or exposure to medication). The group believed that when a woman receives an erroneous negative diagnosis there are no appreciable benefits, but there is the potential of considerable harm to her or her baby. The consequent lack of effective intervention would increase the likelihood of poor outcomes for the woman and her baby, including short- and long-term morbidity.
- The GDG believed that although this technology may be helpful to women who are more likely to experience hypoglycaemic episodes (such as those who experience wide variability in their glucose regulation or who may have hypoglycaemia unawareness), continuous glucose monitoring could provoke anxiety for some women who may feel pressure to manipulate their treatment regimen too frequently in order to achieve overly tight regulation.
- The GDG recognised that frequent self monitoring can provoke anxiety in that some women who may feel pressure to manipulate their treatment regimen or achieve overly tight regulation.
- The potential harms from not being correctly diagnosed with diabetes include not taking up lifestyle advice, a lack of early surveillance for complications (such as retinopathy) and identification of treatable cardiovascular risk factors (for example from serum lipid and blood pressure measurements). The GDG believed that when a woman receives a false-negative diagnosis, the lack of prompt effective treatment would, in turn, increase the likelihood of poor outcomes for the woman.
- The potential harms from being falsely diagnosed with diabetes include psychological stress to the woman, unnecessary screening (for example for retinopathy), changes to costs of items such as travel and life insurance, and the potential of metformin being inappropriately prescribed (although this could be a benefit if it delays progress from impaired glucose tolerance [IGT] to diabetes). The potential harms from not being correctly diagnosed with diabetes include not taking up lifestyle advice, a lack of early surveillance for complications (such as retinopathy) and identification of treatable cardiovascular risk factors (for example from serum lipid and blood pressure measurements).
- Adverse effects of hypoglycaemic medications

See also the "Consideration of clinical benefits and harms" sections in the full version of the guideline (see the "Availability of Companion Documents" field) for details about harms of specific interventions.

Contraindications

Contraindications

- A reference guide to medicines in pregnancy and lactation reported that atorvastatin, fluvastatin, pravastatin and simvastatin are contraindicated in pregnancy and lactation.
- Angiotensin-converting enzyme inhibitors and angiotensin-II receptor antagonists as well as statins should be discontinued before conception or as soon as pregnancy is confirmed.
- Betamimetic medicines for tocolysis should not be used in women with diabetes.
- The British National Formulary recommends that metformin, acarbose and repaglinide should be avoided during pregnancy and are normally substituted with insulin. The manufacturers of nateglinide, pioglitazone and rosiglitazone advise pregnant women to avoid them, and insulin is normally substituted in women with diabetes. Sulphonylureas can lead to neonatal hypoglycaemia, and insulin is normally substituted in women with diabetes. The use of other rapid- and long-acting insulin analogues (glulisine, detemir and glargine) during pregnancy should be avoided until more data are available on their safety.
- Maternal contraindications to metformin include liver or renal impairment or sepsis.
- The manufacturers of sibutramine and rimonabant recommend that they should be avoided in pregnancy.
- At the time of publication (February 2015) glibenclamide was contraindicated for use up to gestational week 11 and did not have UK marketing authorisation for use during the second and third trimesters of pregnancy in women with gestational diabetes. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and

documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#)

[\[link\]](#) for further information.

Qualifying Statements

Qualifying Statements

- This guidance represents the view of the National Institute for Health and Care Excellence (NICE), which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summaries of product characteristics of any drugs.
- Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to have due regard to the need to eliminate unlawful discrimination, advance equality of opportunity and foster good relations. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.
- The guideline will assume that prescribers will use a medicine's summary of product characteristics to inform decisions made with individual patients.
- This guideline recommends some medicines for indications for which they do not have a UK marketing authorisation at the date of publication, if there is good evidence to support that use. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. The patient (or those with authority to give consent on their behalf) should provide informed consent, which should be documented. See the General Medical Council's [Good practice in prescribing and managing medicines and devices](#) [\[link\]](#) for further information. Where recommendations have been made for the use of medicines outside their licensed indications ('off-label use'), these medicines are marked with a footnote in the recommendations.
- Treatment and care should take into account individual needs and preferences. Patients should have the opportunity to make informed decisions about their care and treatment, in partnership with their healthcare professionals. If the patient is under 16, their family or carers should also be given information and support to help the child or young person to make decisions about their treatment. Healthcare professionals should follow the [Department of Health's advice on consent](#) [\[link\]](#). If someone does not have capacity to make decisions, healthcare professionals should follow the [code of practice that accompanies the Mental Capacity Act](#) [\[link\]](#) and the supplementary [code of practice on deprivation of liberty safeguards](#) [\[link\]](#).
- NICE has produced guidance on the components of good patient experience in adult National Health Service (NHS) services. All healthcare professionals should follow the recommendations in [Patient experience in adult NHS services](#) [\[link\]](#).
- If a young person is moving between paediatric and adult services, care should be planned and managed according to the best practice guidance described in the Department of Health's [Transition: getting it right for young people](#) [\[link\]](#).
- Adult and paediatric healthcare teams should work jointly to provide assessment and services to young women with diabetes. Diagnosis and management should be reviewed throughout the transition process, and there should be clarity about who is the lead clinician to ensure continuity of care.

Implementation of the Guideline

Description of Implementation Strategy

Implementation tools and resources to help put the guideline into practice are available on the [National Institute for Health and Care Excellence \(NICE\) Web site](#) [\[link\]](#).

Key Priorities for Implementation

The following recommendations have been identified as priorities for implementation.

Preconception Planning and Care

Advise women with diabetes who are planning to become pregnant to aim for the same capillary plasma glucose target ranges as recommended for

all people with type 1 diabetes¹. [new 2015]

Gestational Diabetes

Diagnose gestational diabetes if the woman has either:

- A fasting plasma glucose level of 5.6mmol/litre or above or
- A 2-hour plasma glucose level of 7.8mmol/litre or above [new 2015]

Antenatal Care for Women with Diabetes

Advise pregnant women with any form of diabetes to maintain their capillary plasma glucose below the following target levels, if these are achievable without causing problematic hypoglycaemia:

- Fasting: 5.3 mmol/litre
and
- 1 hour after meals: 7.8 mmol/litre or
- 2 hours after meals: 6.4 mmol/litre [new 2015]

Test urgently for ketonaemia if a pregnant woman with any form of diabetes presents with hyperglycaemia or is unwell, to exclude diabetic ketoacidosis. [new 2015]

At antenatal appointments, provide care specifically for women with diabetes, in addition to the care provided routinely for healthy pregnant women (see the NICE guideline Antenatal care. Routine care for the healthy pregnant woman). The table in the "Major Recommendations" field describes how care for women with diabetes differs from routine antenatal care. At each appointment, offer the woman ongoing opportunities for information and education. [2008, amended 2015]

Intrapartum Care

Advise pregnant women with type 1 or type 2 diabetes and no other complications to have an elective birth by induction of labour, or by elective caesarean section if indicated, between 37⁺⁰ weeks and 38⁺⁶ weeks of pregnancy. [new 2015]

Advise women with gestational diabetes to give birth no later than 40⁺⁶ weeks, and offer elective birth (by induction of labour, or by caesarean section if indicated) to women who have not given birth by this time. [new 2015]

Postnatal Care

For women who were diagnosed with gestational diabetes and whose blood glucose levels returned to normal after the birth:

- Offer lifestyle advice (including weight control, diet and exercise).
- Offer a fasting plasma glucose test 6 to 13 weeks after the birth to exclude diabetes (for practical reasons this might take place at the 6-week postnatal check).
- If a fasting plasma glucose test has not been performed by 13 weeks, offer a fasting plasma glucose test, or a HbA1c test if a fasting plasma glucose test is not possible, after 13 weeks.
- Do not routinely offer a 75 g 2-hour oral glucose tolerance test (OGTT). [new 2015]

Offer an annual glycated haemoglobin (HbA1c) test to women who were diagnosed with gestational diabetes who have a negative postnatal test for diabetes. [new 2015]

Footnote

¹Because of a lack of evidence on plasma glucose targets for women with diabetes who are planning pregnancy, target ranges will be taken from the updated NICE guideline on [Type 1 diabetes](#) (consultation 10 December 2014 to 4 March 2015). This recommendation will be replaced by one containing the target ranges when the type 1 diabetes guideline update is published (expected August 2015).

Implementation Tools

Clinical Algorithm

Foreign Language Translations

Mobile Device Resources

Patient Resources

Resources

For information about availability, see the *Availability of Companion Documents* and *Patient Resources* fields below.

Institute of Medicine (IOM) National Healthcare Quality Report Categories

IOM Care Need

Living with Illness

Staying Healthy

IOM Domain

Effectiveness

Patient-centeredness

Identifying Information and Availability

Bibliographic Source(s)

National Collaborating Centre for Women and Children's Health. Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. London (UK): National Institute for Health and Care Excellence (NICE); 2015 Feb 25. 65 p. (NICE guideline; no. 3).

Adaptation

Not applicable: The guideline was not adapted from another source.

Date Released

2008 Mar (revised 2015 Feb 25)

Guideline Developer(s)

National Collaborating Centre for Women's and Children's Health - National Government Agency [Non-U.S.]

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National Institute for Health and Care Excellence (NICE)

Guideline Committee

Guideline Development Group

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Financial Disclosures/Conflicts of Interest

All Guideline Development Group (GDG) members' and external advisers' potential and actual conflicts of interest were recorded on declaration forms provided by National Institute for Health and Care Excellence (NICE) and are presented in Appendix B of the full version of the guideline (see the "Availability of Companion Documents" field). The forms covered personal pecuniary interests (including consultancies, fee-paid work, shareholdings, fellowships and support from the healthcare industry), personal non-pecuniary interests (including research interests), personal family interests (including shareholdings) and non-personal pecuniary interests (including funding from the healthcare industry for research projects and meetings). The GDG chair and National Collaborating Centre for Women's and Children's Health (NCC-WCH) project director considered all the declarations and concluded that none of the declared interests constituted a material conflict of interest that would influence the recommendations developed by the GDG.

See also Section 4.4, Declarations of Interests, in the original guideline document.

Guideline Status

This is the current release of the guideline.

This guideline updates a previous version: National Collaborating Centre for Women's and Children's Health. Diabetes in pregnancy. Management of diabetes and its complications from pre-conception to the postnatal period. London (UK): National Institute for Health and Clinical Excellence (NICE); 2008 Mar. 21 p. (Clinical guideline; no. 63).

This guideline meets NGC's 2013 (revised) inclusion criteria.

Guideline Availability

Electronic copies: Available from the [National Institute for Health and Care Excellence \(NICE\) Web site](#) . Also available for download in ePub or eBook formats from the [NICE Web site](#) .

Availability of Companion Documents

The following are available:

- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Full guideline. London (UK): National Institute for Health and Care Excellence; 2015 Feb 25. 681 p. (NICE guideline; no. 3). Electronic copies: Available in from the [National Institute for Health and Care Excellence \(NICE\) Web site](#) .
- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Appendices A-G, I-N. London (UK): National Institute for Health and Care Excellence; 2015 Feb. 286 p. (NICE guideline; no. 3). Electronic copies: Available from the [NICE Web site](#) .
- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Appendix H. London (UK): National Institute for Health and Care Excellence; 2015 Feb. 328 p. (NICE guideline; no. 3). Electronic copies: Available from the

NICE Web site .

- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Costing statement. London (UK): National Institute for Health and Care Excellence; 2015 Feb. 12 p. (NICE guideline; no. 3). Electronic copies: Available from the NICE Web site .
- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Baseline assessment tool. London (UK): National Institute for Health and Care Excellence; 2015 Feb. (NICE guideline; no. 3). Electronic copies: Available from the NICE Web site .
- The guidelines manual 2012. London (UK): National Institute for Health and Care Excellence (NICE); 2012 Nov. Electronic copies: Available from the NICE Web site .

Patient Resources

The following is available:

- Diabetes in pregnancy: management of diabetes and its complications from preconception to the postnatal period. Information for the public. London (UK): National Institute for Health and Care Excellence; 2015 Feb. 28 p. (NICE guideline; no. 3). Electronic copies: Available from the National Institute for Health and Care Excellence (NICE) Web site . Also available for download in ePub or eBook formats from the NICE Web site . Also available in Welsh from the NICE Web site .

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NGC Status

This NGC summary was completed by ECRI Institute on December 2, 2009. This summary was updated by ECRI Institute on August 28, 2015. This summary was updated by ECRI Institute on April 15, 2016 following the U.S. Food and Drug Administration advisory on Metformin-containing Drugs.

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